EPS FOAM MODULAR CONSTRUCTION SYSTEM AND METHOD

CROSS REFERENCE TO RELATED APPLICATIONS

The present application is related to and takes priority from U. S. Provisional Patent Applications Serial Nos. 60/441,035, filed January 18, 2003 and 60/452,025, filed March 5, 2003, the entire contents of which are expressly incorporated herein by reference.

FIELD OF THE INVENTION

The present invention is related to modular EPS foam building materials and, more particularly, to standardized foam building blocks assembled for rigid single piece performance without using tools or adhesives.

BACKGROUND OF THE INVENTION

Modular building panels have a rather broad utility in the construction industry and are used to form a number of prefabricated structures, such as sheds, warehouses, and the like. However, there are a number of structures that do not require fabrication from conventional materials. These structures are generally erected outdoors and are not required to conform to construction building codes.

In particular, such structures may comprise a child's playhouse, for example, a basis for a decorative exterior wall or fence, a tool storage shed, pool house, or even a non-code living enclosure such as a gazebo, breezeway, or porch enclosure or sunroom.

Fabricating these structures from conventional materials such as metal or wood framing and plywood facing is costly and typically requires the services of experienced construction contractors. The materials used in these construction projects are bulky and rather heavy, making them difficult to purchase and transport in a normal comsumer's vehicle and are further relatively unwieldy for a casual consumer to manipulate.

Although foam materials have been frequently incorporated into various construction techniques, foam has not been previously used for structural aspects of a structure. Foam materials have been used to define alignment tools for cinderblock structures, for example, but have not been used in place of the cinderblocks themselves.

Since many structures are not required to conform to building code requirements, it would be useful if foam materials could be incorporated into the structural and load bearing aspects of such structures in place of the more bulky conventional materials. In order to have such structures be easily designed and assembled, foam structural materials should be provided in standardized shapes and sizes, such that they need only be assembled in accordance with simple printed instructions and affixed together utilizing a standardized interlock member.

Given such a standardized shape and size, such foam materials can be combined together in order to form

structures in a manner similar to the well known LEGGO™ building block system.

Thus, it will be seen that there is a need for a simple, inexpensive and lightweight construction element set that can be assembled into a structure without the use of adhesives or fasteners but nevertheless provide a rigid and structurally sound final product. Because the pieces are generally standardized, a structure of any size or shape may be implemented from standard pieces by merely adding or deleting a course from the length or height of a particular structural dimension. Such a system should also incorporate non-linear construction elements, such as rounded corner panels, angled abutments, and the like.

SUMMARY OF THE INVENTION

Such a modular foam construction system is described below. In a first aspect, the invention is characterized in terms of a modular system for constructing substantially rigid structures from polystyrene materials and suitably comprises a set of building panels, of predetermined shape, which are configured to define a structure when the panels are arranged and aligned together in accord with a plan or set of instructions.

a plurality of predefined interlock slots is formed into each panel and disposed at panel locations at which panels are to be aligned in order to define a structure. For example, an interlock slot of an edge portion of a first panel is juxtaposed, in face-to-face manner, with an interlock slot of an edge portion of a second panel when

the panels are arranged and aligned together. A plurality of interlock keys are configured for friction fit insertion into the juxtaposed interlock slots. An interlock key spans the interlock slots of two panels so as to further align the panels and substantially locks the panels together at the key/slot joint. Specifically, the building panels, interlock slots and interlock keys are formed from EPS polystyrene foam material and are affixed together in order to define a structure without use of adhesives or conventional fasteners.

In a further aspect of the invention, interlock slots are formed as female-type, dove-tail slots having predefined lateral dimensions, and interlock keys are formed as male-type dove-tail, members having predefined lateral dimensions oversized from the predefined lateral dimensions of the interlock slots. Specifically, the predefined lateral dimensions of the slots and keys comprise the spacing between opposing angled sidewalls. The spacing between opposing angled sidewalls of an interlock key is oversized to the spacing between opposing angled sidewalls of an interlock slot by an amount ranging from about 0.005 inches to about 0.007 inches.

One of the advantageous features of the invention is the ability to join panels together along abutting edges and along contiguous faces. Two building panels are joined together at abutting edges by an interlock key having two adjoining joint members, disposed in opposing relationship, each joint member insertable in a respective panel's interlock slot, so as to lock the panels together in an edge-to-edge relationship. Two building panels are joined

together along contiguous faces by an interlock key defining a single joint member, the joint member insertable in a respective panel's interlock slot and spanning a contiguous slot defined by adjoining panels, so as to lock the panels together along their faces.

In a further feature, an interlock key comprises a multiplicity of joint members, disposed at angles with respect to one another such that panels are joined together in accord with the angles of the joint members in order to form structures having other than right angles at particular joints.

A method for fitting together building elements formed from polystyrene foam in a manner providing structural rigidity sufficient for light duty structures or enclosures comprises defining a set of building panels, of predetermined shape, the panels configured to define a structure when the panels are arranged and aligned together and forming a plurality of predefined interlock slots into each panel at particular panel locations at which panels are to be joined together in order to define a structure.

At least a first and second panel are aligned together so as to juxtapose respective interlock slots with one another and the juxtaposed interlock slots of two panels are spanned with at least one interlock key, the key configured for friction fit insertion into the juxtaposed interlock slots, the interlock key further aligning the panels and substantially locking said panels together at the key/slot joint. An interlock slot comprises a trapezoidal channel having a floor or bottom, an opening or throat and two opposing angled sides such that the width

dimension of the channel floor is larger than the width dimension of the channel throat. An interlock key comprises a trapezoidal member having a shape conforming to the shape of the channel, and wherein the interlock key has width dimensions at its respective angled sides oversized from the width dimensions of a respective slot's angled sides, such that insertion of a key into a corresponding slot defines a surface friction force at adjoining angled side surface interfaces.

Advantageously, insertion of a key into a corresponding slot defines a surface friction force at adjoining angled side surface interfaces thereby keeping two joined panels in relatively rigid alignment. The angled sides of the interlock slots and keys cooperate to define a locking force along the length of adjoining angled sides as the key is inserted into a corresponding slot, the locking force directed towards an interlock channel floor, thereby exerting a pulling force on an interlock key and encouraging a further frictional fit bond between a slot and a key along the channel floor.

DESCRIPTION OF THE DRAWINGS

These and other features, aspects and advantages of the present invention will be more completely understood when considered in connection with the following specification, appended claims and accompanying drawings, wherein:

FIG. 1a is a plan view of an exemplary standard building panel, constructed in accordance with the practice of the present invention;

Fig. 1b is a top view of the exemplary building panel of Fig. 1a;

Fig. 1c is an end view of the exemplary building panel of Fig. 1a;

FIG. 2a is a semi-schematic cross-sectional view of a dual interlock key and two building panels incorporating interlock slots;

Fig. 2b is semi-schematic cross-sectional view of a single sided interlock key in accordance with the invention;

Fig. 2c is a semi-schematic cross-sectional view of two building panels joined and locked together by an interlock key;

Fig. 3a is a cross-sectional view of two building panels and an additional embodiment of an interlock member in accordance with the invention;

Fig. 3b is a cross-sectional view of two building panels joined together by the interlock member of Fig. 2a;

Fig. 4a is a cross-sectional view of an additional embodiment of an interlock member for joining angled panels;

Fig. 4b is a cross-sectional view of multiple building panels joined at angles to one another by the interlock member of Fig. 4a;

Fig. 5a is a top view of a wall structure constructed in accordance with principals of the invention;

Fig. 5b is a front plan view of the wall of Fig. 5a;

Fig. 5c is an end view of the wall of Fig. 5a;

Fig. 6a is a top plan view of the initial construction stage of a hexagonal structure utilizing principals of the present invention;

Fig. 6b is a semi-perspective view of the structure of Fig. 6a;

Fig. 7a is a plan view of a next stage of construction of a hexagonal structure;

Fig. 7b is a semi-perspective view of the structure of Fig. 7a;

Fig. 8a is a top view of a third stage of construction of a hexagonal structure;

Fig. 8b is a semi-perspective view of the structure of Fig. 8a;

Fig. 9a is a top view of a fourth stage in the construction of a hexagonal structure; and

Fig. 9b is a semi-perspective view of a completed hexagonal structure constructed in accordance with principal to the present invention.

DESCRIPTION OF THE INVENTION

Briefly, the invention is characterized as a set of modular building components that fit together in order to form "constructs" for other structures, in a manner similar to the well known LEGGO™ building block system. In the context of the specification, a "construct" may be any structure or structural portion that is comprised of multiple pieces that are affixed together. For example, a storage shed is considered a "construct" in that it is comprised, in its simplest form, of four walls, a roof (flat or peaked), a door and perhaps other elements such as a window, dormer, or the like.

The system of the present invention comprises a number of standardized pieces utilizing molded or custom cut expanded polystyrene (EPS) foam shapes having standardized sizes and particular densities for the particular "construct" desired. The standardized pieces are fit together utilizing an "interlock slot and key" system which, while superficially similar to a dove-tail joint utilized in woodworking, is particularly sized and shaped to provide structural rigidity to coupled blocks.

While the building blocks of the present invention are characterized as standardized in size and shape, this is more for the sake of ease of description than a limitation on the practice of the invention. Indeed, the building blocks (also termed building panels, or simply panels) of the present invention may be provided in a set of universal sizes, for creative building purposes, or might be provided in custom or unique shapes for specific building projects. Particularly, the use of EPS foam allows for the building

blocks to be simply and easily cut, whether by wire, hot wire, laser, or router, into any desired shape and having any desired surface texture. Specifically, the type of EPS foam contemplated for use with the present invention is Type-IX expanded polystyrene having a nominal density of 2.0 pounds per cubic foot (lb/ft^3). This is also commonly known as 2 pound foam to those having skill in the art.

Common 2 pound foam exhibits a compressive strength of 25.0 psi at 10% deflection and a flexural strength of 50.0 psi. EPS foam is inert, highly stable, contains no formaldehyde and is not manufactured with CFCs. EPS foam is particularly suitable for construction applications since it is extremely light in weight, versatile, sanitary, energy efficient and most of all cost effective.

Turning now to Figs. 1a, 1b, and 1c, there is depicted in plan, top and side view, respectively, a standard building block or panel 10 constructed of EPS foam, in accordance with the present invention. It can be seen from the exemplary embodiment of Fig. 1a that the standardized building panel 10 is formed from a generally rectangular slab of 2 pound EPS foam. The panel 10 is provided in a number of configurations, 24 inch lengths, 36 inch lengths, 48 inch lengths, and the like, and correspondingly graded heights, in order to define a set of uniformly increasing panel sizes. Depending on the "construct" desired to be built, each of the blocks or panels 10 are provided in standard thicknesses of 4 inches, 5 inches, 6 inches, and the like. For purposes of discussion, the particular exemplary embodiment of Figs. 1a, 1b, and 1c, will be

described in terms of a standard panel block having a length of 36 inches, a height of 12 inches and a thickness of 6 inches.

A series of female dove-tail "interlock slots" 12 are formed in the front face 14 of each block, as well as the back face 16, the top surface 18, bottom surface 20, right hand 22 and left hand 24 edges. The interlock slots 12 may be formed by routing the slot cutouts from a uniform 6 inch thick panel of EPS foam which has been cut to the desired standard size (12x36, for example). In a 36 inch long foam panel, it is contemplated that the interlock slots are disposed approximately 12 inches apart on centers, with the first slot on either face being provided about 6 inches from either end. The interlock slots on the top and bottom edges, as well as the two ends, are centered along the edge dimension.

In accordance with the invention, the interlock slots are configured as female-type dove-tail joints and are shaped such that the widest portion of the dove-tail (i.e., at the bottom of the cutout) has a linear dimension approximately 1/3 that of the thickness of the EPS panel into which it is routed or cut. In effect, a female interlock slot would exhibit a maximum width, at the bottom of the channel, of approximately 2 inches, were the EPS panel to be a 6 inch thick panel. Necessarily, the interlock slot will decrease in size as the panel thickness decreases.

Additionally, although the interlock slot is described as exhibiting a width of about 1/3 the thickness of a panel, this is not intended to represent a limitation on the configuration of a slot. The size of a slot depends on the corresponding size of an inserted "key", as will be described further below. Key and slot widths may be allowed to vary as a function of the panel width and as a function of the surface contact area as well as the amount of bulk material defining the thickness of a key. A thicker key will result in a greater degree of material resistance to lateral and bending forces, with a correspondingly greater degree of joint rigidity. Thus, interlock slot and key dimensions may be varied to conform to structural design considerations and are not limited to specific and fixed thicknesses, depths, and the like.

The slot aspect ratio is preferably less than 1:1, for reasons which will be developed further below, but may, indeed, be provided at a 1:1 aspect ratio without violating the scope and spirit of the present invention. A suitable aspect ratio for practice of the invention might be 0.8:1, with 0.8 referring to the depth of the slot as a function of the width at the bottom of the channel.

Similarly, the sides of the interlock slot are angled inwardly at the mouth of the opening, so as to define a smaller linear width dimension at the opening throat than at the bottom of the slot. In particular, a suitable angle for each of the opening sides is from about 6° to about 7.5°. Although these angles appear to be most suitable for practice of the invention, the actual values are not

critical. A certain degree of variation is allowable, so long as the system's structural integrity and rigidity is not compromised, as will be explained in greater detail below.

The particular form and location of the interlock slots 12 on a standardized block 10 allows for positioning and location of other standardized blocks with respect to the first block. The interlock slots define locations at which "interlock keys" are inserted so as to tie multiple blocks together in a manner that locks one block to another, provides structural rigidity to the resulting "construct" in a manner heretofore unrealizable in EPS foam materials.

Turning now to Figs. 2a, 2b, and 2c, there is depicted a male-type "interlock key" 30 which functions to join and lock together two standardized building blocks (indicated at 10) in a manner that insures structural integrity and rigidity of the pieces. From the exemplary embodiment of Fig. 2a, it will be understood that an "interlock key" 30 is configured as a male-type dove-tail key that is shaped so as to slide into the female-type dove-tail "interlock slot" 12 in secure fashion. The interlock key 30 is also formed from 2 pound EPS foam and is contemplated, in one aspect, as comprising two superposed male-type dove-tale joints on an elongate member. The interlock key is typically provided in uniform lengths which equal the uniform length dimensions of a standard building panel such as described in the exemplary embodiments of Fig. 1a, 1b, and 1c. Where a building block is 36 inches long and 12

inches high, interlock keys will necessarily be provided in both 36 inch and 12 inch lengths.

It should be understood that the interlock key 30 (more correctly ½ of the interlock key) has depth corresponding to the depth of an associated interlock slot 12. However, the width or thickness of the engaging sides of the interlock key are dimensioned to be approximately 0.005 inches oversized to the corresponding dimension of the interlock slot. Suitable oversize dimensions range from about 0.004 inches to about 0.007 inches. Accordingly, as the interlock key member is slid into the interlock slot, the sides of the key engage the sides of the slot in a substantial friction fit and, because of the joint angle, serves to pull the slot into tight engagement with the key. It could also be said that the key 30 is pulled into tight engagement with the slot 12 by virtue of the dimensional oversize and the action of the sidewall angles.

It should also be understood that the friction fit is further dependant on the surface contact area between the slot and key as well as the surface texture of the mating surfaces. Where the respective surfaces are "rough cut" there will necessarily be a greater surface friction resistance to both insertion and extraction forces. Surface preparation can thus be varied in order to give a range of friction fit characteristics, with smooth surface preparation allowing for a smoother insertion and easier extraction, but with a slightly reduced joint strength.

Insertion may be performed in a number of ways, with the key 30 being inserted into one slot 12 of one panel 10

and then another panel having its interlock slot slid over the exposed surface of the other half of the key 30 until it is positioned correctly. Alternatively, two panels may be butted together at their respective edges and the interlock key engaged to both interlock slots simultaneously. In this case, the key dove-tail angle and dimensional oversize functions to pull the two panels together until their edge faces 32 are butted tightly together. The compression forces along the panel edges give rigidity to two panels joined together in this fashion making, in effect, a composite piece having substantially the same rigidity and integrity as a single panel. In order to ensure that adjoining edges of butting panels are rigidly and securely compressed together, it may be desirable to form the interlock key 30 such that its bottom surface is approximately 0.005 inches from the bottom channel surface of the interlock slot 12. This will increase the "pulling" forces on each of the panels and further ensure that maximum compression is developed along the respective edge faces 32.

Notably, panels are secured together through the friction fit of a slightly oversized interlocked key 30 being disposed within an interlock slot 12. Having an interlock key formed with substantially the same depth as the interlock slot allows the bottom faces of the key and the slot to engage, thereby increasing contact surface area and maximizing bit friction. In this particular case, structural rigidity is a function of how tightly the key 30 is bound to the slot 12. Even though there is no gap developed between the bottom of the key and the bottom of

the slot, sufficient compressive force is still developed between two panels so as to lock the panels together into a rigid composite unit.

Although the exemplary embodiment of Fig. 2a depicts an interlock key 30 as comprising two juxtaposed dove-tail key members, it will be understood that interlock keys may be defined as a single male-type dove-tail shape as depicted in the exemplary embodiment of Fig. 2c. The juxtaposed shape of Fig. 2a is particularly suitable when it is desired to marry two panels together at their edges. The single key of Fig. 2c is particularly suited for aligning and binding the edges of two panels together when one panel is placed lengthwise atop another panel. In this particular case, where each panel is 12 inches tall, the single joint key might be 24 inches long and slid into each of the panels end slots.

Further, and as will be described in greater detail below, similar alignment and security may be had by inserting a single joint key into the interlock slots disposed on the front and back faces of two blocks if one block were to be disposed lengthwise atop another. Thus, given the exemplary standardized panel of Figs. 1, a single joint key would be inserted into each of the right hand and left hand edge slots and the three slots on each panel's front face, as well as the three slots on each panel's back face. For additional rigidity and security, a dual joint key (Fig. 2a) may be inserted into the "butterfly" openings defined by the lower panel's top edge slot and the upper panel's bottom edge slot.

An additional embodiment of how an interlock key may be formed is depicted in the additional exemplary embodiment of Figs. 3a and 3b. In particular, an interlock key 34 may be provided with a male-type dove-tail key 36 disposed at one end and a female-type dove-tail interlock slot 38 disposed at the other end. Each of the respective keys and slots are formed in a member manufactured of 2 pound EPS foam having substantially the same thickness dimension as the panels which are desired to be joined. In this particular case, one of the panels 40 is manufactured with a male-type dove-tail interlock key formed along one edge and having the same oversize characteristics as a separately provided interlock key. The male key block may also be inserted directly into a standard block with an interlock key as well as secured to a standard block through a male/female interlock 34 as depicted in Figs. 3a and 3b.

An additional configuration is depicted in Figs. 4a and 4b, where it might be found desirable to join together several building panels at angles to one another. In the particular configuration of Fig. 4a, an interlock member 40 is depicted as comprising a female-type dove-tail interlock slot 42 on one side of a generally pentagonal bulk shape, and two male-type dove-tail interlock keys 44 angled approximately 30° apart from one another on the bulk member's opposite side. As shown in Fig. 4b, a building panel 43 has a male-type interlock key disposed along one edge, with the interlock member being slid over the interlock key of the panel 43. Two standard panels 10 have interlock slots disposed along their edges and the slots

are engaged with the angled interlock keys 44 defined by the interlock member 40. In this manner, complex building shapes may be defined that include panels that are disposed at angle with respect to one another. This is particularly suitable in the case of a child's playhouse where it is desirable to provide a peaked roof for aesthetic purposes. Although, hexagonal gazebos can be simply and easily constructed utilizing this principal.

It should further be noted that although the interlock member 40 of Fig. 4a is depicted with two male-type interlock keys and one female-type interlock slot, it may just as easily have an interlock key defined on the bottom face in place of the interlock slot 42. Depending on the application, it might be desirable to define an interlock slot in the pentagonal member 40 for purposes of rigidity. If this is the case, the bottom surface of the pentagonal member might also define a rectilinear cutout 46 into which the interlock slot 42 is defined. The cutout 46 would serve to define interior shoulders that receive the edge surface and edge shoulders of a building panel 43 that is engaged to the interlock slot 42. This particular configuration allows for maximum rigidity against sideways deflection forces as might be the case where the weight on one of the angularly displaced panels was greater than the weight supported by the other angularly displaced panel.

The use of standard EPS foam building panels and standard EPS foam interlock keys in constructing a structure will now be discussed in connection with the exemplary embodiment depicted in Figs. 5a, 5b and 5c which show the top, plan and end view, respectively, of a wall

constructed in accordance with the present invention. The wall might be a simple free standing wall or, alternatively, it could form a wall portion of an easily assembled tool shed, child's playhouse, backyard gazebo, pool house or any other structure, housing or "construct" which does not have to meet dwelling building codes.

In the exemplary embodiments of Figs. 5a, 5b, and 5c, building panels of three separate standardized sizes are depicted as being joined together to form the wall. A 24 inch panel 50 will be understood as comprising two interlock slots 12 disposed on each of its front and back surfaces, as indicated in Figs. 5a and 5b. A 36 inch long panel 52 is substantially similar to the exemplary embodiment of Figs. 1 and has three interlock slots disposed on each of its front and back surfaces. A 48 inch panel 54 will necessarily have four interlock slots disposed on each of its front and back surfaces, in accordance with the general rule of slots being disposed on 12 inch centers and 6 inches from the left and right edge of each panel.

It will also be noted in the exemplary embodiment of Figs. 5, that the panels are stacked, bottom edge to top edge, atop one another such that their facial interlock slots line up vertically. As shown in the exemplary embodiment of Fig. 5c, a dual interlock key 30 (Fig. 2a) is inserted into the juxtaposed interlock slots of the panel top and bottom edges. Likewise, and as shown in Fig. 5a, the building panel's left and right edges are locked together by sliding a dual interlock key (Fig. 2a) into the juxtaposed left and right interlock slots. The various

panels are now locked together horizontally and vertically, but to maximize structural rigidity and integrity of the completed structure, single sided interlock keys 31 (Fig. 2b) are engaged to the vertically aligned facial interlock slots of the various panels.

As shown in the exemplary embodiment of Fig. 5b, the single sided keys 31 are provided in two separate lengths, one length equal to the height of the panel (approximately 12 inches) while another length is one half height of a panel (approximately 6 inches). This is to allow the foam material of the key to span the butt joint between two blocks' top and bottom edges. The joint between two consecutive single sided (or double sided) keys falls in the center of a panel's material bulk, thereby minimizing superposed joints and potential areas of weakness.

From the foregoing, it can be understood by those having skill in the art, that a multi-angled interlock member (such as member 40 of Fig. 4a) can be inserted in any one of the facially disposed or end disposed slots so as to define the starting point of an additional all structure or structures positioned at an angle the first. Any number of panels can be fit together at any angle with respect to one another and to any desired surface area, by merely providing an appropriate interlock slot in an appropriate location for receiving and interlock key once two shapes or structures have their respective slots aligned.

A further exemplar of how the modular EPS foam construction system and method in accordance with the invention might be utilized to realize a complex structure

is shown in the exemplary embodiments of Figs. 6, 7, 8 and 9. Specifically, the referenced figures depict the construction of a hexagonal structure that is sufficiently rigid to function as the structural support for a stone or brick bench that might be constructed to surround a favorite tree, for example or to surround a fire pit, or the like.

Specifically, and with respect to the exemplary embodiments of Figs. 6a and 6b, the structure begins with a generally circular piece of 2 pound EPS foam 60 which may or may not have a central cut-out, depending on desired application. The circular base 60 includes socket cut-outs 62 into which vertical panel blocks 64 are inserted. The cut-outs 62 may be formed slightly undersized to the thickness dimension of the vertical panels 64, such that the vertical panels friction fit into the cut-outs 62. Each of the vertical support panels 64 terminates in a male-type dove-tail interlock key 66 on its outward facing edge. The vertical supports disposed about the circumference of the base 60.

Turning now to Figs. 7a and 7b, an angled interlock member 40 (Fig. 4a) is secured to the outer edge of each of the vertical support panels 64. Each angled member 40 receives the panel's interlock key in an associated interlock slot and functions to transform the single interlock key of each vertical panel 64 into two angled interlock keys.

Suitably, two adjacent vertical panels may be locked together by a linear EPS foam panel 66 having interlock slots cut into one surface so as to join adjacent interlock

keys. Once all of the interlock keys join together by circumferentially disposed exterior panels 66, the entire structure is now substantially locked together and rigid, as depicted in the exemplary embodiment of Fig. 8a and 8b.

It will also be noted that the angled interlock members 40 are slightly longer than the height dimension of both the vertical panels 64 and the exterior panels 66. The top edges of both the vertical panels 64 and exterior panels 66 lie in the same plane, with the top ends of the angled members 40 projecting beyond that plane by a certain distance. This is to allow a set of cover panels to be pressed over the surface of the underlying hexagonal support with the extended portions of the angled interlock members 40 fitting within corresponding shaped receptacles cut into the surface panels 68. It should further be noted that the receptacles cut into the surface panels also incorporate interlock slots which receive interlock key portions of the each of the angled interlock members. This functions to provide compression forces to the surface panels and to further lock the structure together and make it rigid. The bottom surfaces of the surface panels 68 rest on the top edges of the vertical support panels 64 and the top edges of the exterior panels 66. When constructed in this fashion, the resulting EPS foam article is capable of supporting the weight of several persons, making it an ideal construct for outdoor, backyard seating.

It should also be understood that once any of the above-mentioned foam structures have been completed, they may be finished with any form of surface texture that is desired. Faux brick, rock, stucco or even stone or marble

slabs can be affixed to the exterior exposed surfaces of the completed foam article in conventional fashion. Thus, even though constructed of and structurally dependant on EPS foam, the article may be finished-off to look as though it were made of stone. In the case where the desired construct is a child's playhouse or a tool or pool shed, the construct might be finished off with an exterior siding appliqué to make it appear as though it were a frame-and-board construction.

It should also be noted that although various interlock keys have been described and depicted as made from 2 pound EPS foam, other materials are also suitable for forming the keying function. Interlock keys may be cut or milled from wood, for example, where it is desired to provide a natural wood accent in an otherwise all foam structure. In this particular case, a wooden key will also allow for conventional fasteners to utilized where conventional materials must be added to or incorporated into a foam construct. Wooden keys allow for incorporation of screws and nails into the construction, as well as adding a "natural" accent to a finished product.

For certain other construction applications, it might be desirable to provide the edge keys in metal, for example, if it is desired to screw or bolt an EPS foam structure to a metal or wooden wall. Similarly, a metal interlock key disposed along the bottom edge of a foam structure can be milled with an internal "T" slot such that bolt or pins might be extended from particular locations along the length of the key so as to be countersunk into concrete, for example.

Although the foregoing exemplary embodiments have been characterized in terms of the exemplars of the figures, it will be understood by those having skill in the art that building panels need not be uniformly rectangular in shape nor need the interlock slots (or interlock keys) be disposed in specific locations thereon. Indeed, building panels might be curved so as to allow construction of completely circular shapes or shapes with certain amount of desired curvature such as a child's playground slide, for example.

Building panels may be cut in custom shapes depending upon the desired structure, such that one is not limited to the particular dimensions imposed by 24, 36 or 48 inch panels. As discussed, panels can be hexagonal, pentagonal, triangular or any other shape as required. EPS foam is so simple to cut that no shape can reasonably be excluded from contemplation of the present invention. Indeed, all that is requires is that panels constructed if EPS foam be rigidly locked and joined together by inserting an interlock key into an interlock slot as discussed above.

Those having skill in the art will recognize that a multitude of other shapes and configurations are equally suitable for practice to the present invention. Accordingly, the invention is not intended to be limited to the particular embodiments discussed and depicted above, but rather defined by the scope of the appended claims.